vibratory urticaria

Vibratory urticaria is a condition in which exposing the skin to vibration, repetitive stretching, or friction results in allergy symptoms such as hives (urticaria), swelling (angioedema), redness (erythema), and itching (pruritus) in the affected area. The reaction can be brought on by towel drying, hand clapping, running, a bumpy ride in a vehicle, or other repetitive stimulation. Headaches, fatigue, faintness, blurry vision, a metallic taste in the mouth, facial flushing, and more widespread swelling (especially of the face) can also occur during these episodes, especially if the stimulation is extreme or prolonged. The reaction occurs within a few minutes of the stimulation and generally lasts up to an hour. Affected individuals can have several episodes per day.

Frequency

Vibratory urticaria is a rare disorder; its prevalence is unknown. It belongs to a class of disorders called physical urticarias in which allergy symptoms are brought on by direct exposure to factors such as pressure, heat, cold, or sunlight. Physical urticarias have been estimated to occur in up to 5 per 1,000 people.

Genetic Changes

Vibratory urticaria can be caused by a mutation in the *ADGRE2* gene. This gene provides instructions for making a protein found in several types of immune system cells, including mast cells. Mast cells, which are found in many body tissues including the skin, are important for the normal protective functions of the immune system. They also play a role in allergic reactions, which occur when the immune system overreacts to stimuli that are not harmful. The specific role of the ADGRE2 protein in mast cells is not well understood.

The ADGRE2 protein consists of two parts (subunits) that interact with each other: an alpha subunit that lies on the outside surface of the cell and a beta subunit that crosses the cell membrane and extends into the cell. The *ADGRE2* gene mutation that causes vibratory urticaria changes a single protein building block (amino acid) in the alpha subunit, altering the protein structure and leading to a less stable interaction between the two subunits. This fragile connection can be more easily broken; vibration, friction, or stretching of the skin can disrupt the association between subunits in mast cells. Researchers suggest that once the subunits are disconnected, the beta subunit signals the mast cells to react and produce the allergy symptoms in the skin that occur in vibratory urticaria.

Some people with vibratory urticaria do not have a mutation in the *ADGRE2* gene. In these affected individuals, the cause of the disorder is unknown.

Inheritance Pattern

This condition is inherited in an autosomal dominant pattern, which means one copy of the altered gene in each cell is sufficient to cause the disorder.

In most cases, an affected person has one parent with the condition.

Other Names for This Condition

- DDU
- dermodistortive urticaria
- VBU
- vibratory angioedema

Diagnosis & Management

Genetic Testing

- Genetic Testing Registry: Vibratory angioedema
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0473546/
- Genetic Testing Registry: Vibratory urticaria
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C1852146/

General Information from MedlinePlus

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html

Additional Information & Resources

MedlinePlus

- Encyclopedia: Angioedema
  https://medlineplus.gov/ency/article/000846.htm
- Encyclopedia: Hives
  https://medlineplus.gov/ency/article/000845.htm

- Health Topic: Allergy
  https://medlineplus.gov/allergy.html
- Health Topic: Hives
  https://medlineplus.gov/hives.html

Genetic and Rare Diseases Information Center

- Vibratory urticaria
  https://rarediseases.info.nih.gov/diseases/9806/vibratory-urticaria

Additional NIH Resources

- National Institute of Allergy and Infectious Diseases: NIH Scientists Discover Genetic Cause of Rare Allergy to Vibration
  https://www.niaid.nih.gov/news-events/nih-scientists-discover-genetic-cause-rare-allergy-vibration

Educational Resources

- American Academy of Allergy, Asthma, and Immunology: Allergic Skin Conditions
  http://www.aaaai.org/conditions-and-treatments/library/at-a-glance/allergic-skin-conditions
- American Academy of Dermatology: Hives
  https://www.aad.org/public/diseases/itchy-skin/hives
- Disease InfoSearch: Vibratory angioedema
  http://www.diseaseinfosearch.org/Vibratory+angioedema/7390
- KidsHealth: Hives
  http://kidshealth.org/en/parents/hives.html
- MalaCards: vibratory urticaria
  http://www.malacards.org/card/vibratory_urticaria
- Merck Manual, Consumer Version: Physical Allergy
  http://www.merckmanuals.com/home/immune-disorders/allergic-reactions-and-other-hypersensitivity-disorders/physical-allergy
- TeensHealth: Hives
  http://kidshealth.org/en/teens/hives.html

Patient Support and Advocacy Resources

- Allergy and Asthma Foundation of America
  http://www.aafa.org/page/hives.aspx

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28vibratory+urticaria%5BTIAB%5D%29+OR+%28vibratory+angioedema%5BTIAB%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D

OMIM

- VIBRATORY URTICARIA
  http://omim.org/entry/125630

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